

FIG. 1

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Electrical energy port 133 is coupled to a source of electrical energy. Patient has voided, and is positioned on table.

Patient's external genitalia and surrounding anatomy are cleansed with an appropriate agent.

The visualization port 131 is coupled to the appropriate visualization apparatus.

The apparatus port 132 is coupled to an external device such as a pH meter, pressure gauge or other medical monitor.

The energy port 136 is coupled to a source of RF or other therapeutic energy.

The tapered tip 115 is lubricated and introduced into the urethral meatus in an upward and backward direction, in much the same way a Foley catheter is introduced.

The catheter 110 is threaded through the urethra until the treatment element 114 is at the further reaches of the trigone region.

The position of the catheter 110 is checked using visualization apparatus coupled to the visualization port 131. The position of the treatment element 114 is adjusted, if necessary, so that the electrodes 119 grab onto the tissue and are bunching it together.

A cooling liquid such as sterile water, saline or glycerin is exuded from the aperture 118 into the lower region of the bladder.

Electrodes are selected using the electrode selection and control switch. This step may be repeated any time prior to step 217.

Suction apparatus is coupled to the irrigation and control ports 135 so that suction may be effected through the irrigation and control ports. The tissue surrounding the treatment element may be aspirated so as to conform it to the treatment element 114.

The energy port 136 is manipulated so as to cause a release of energy from the electrodes 119. This release of energy creates a pattern of lesions in the mucosal and submucosal tissues of the trigone area. Alternatively, a different method or treatment may be effected by partially or completely ablating nerves responsible for the sensation of urinary urgency.

The catheter is repositioned so that the treatment element 114 is closer to the bladdemeck.

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The energy port 137 is manipulated so as to cause a release of energy from electrodes 119.
This is similar to step 211.

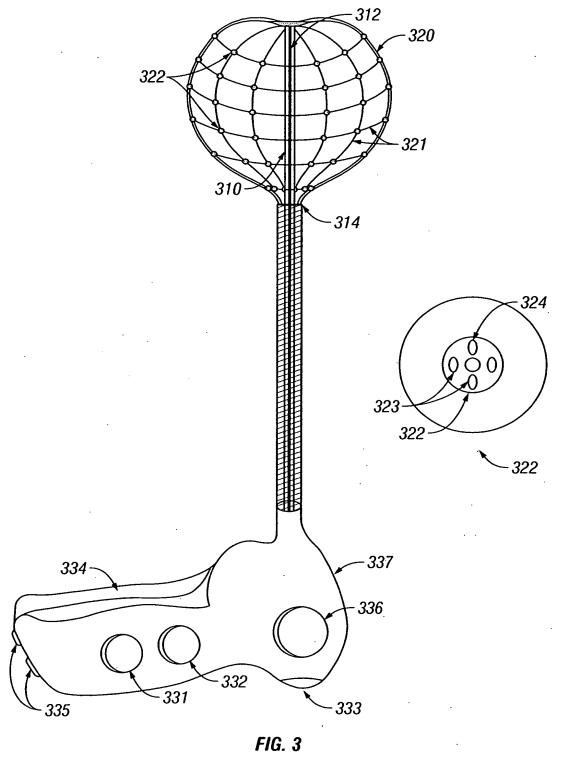
The catheter 110 is repositioned for a final time so that the treatment element 114 is immediately adjacent to the bladderneck.

To FIG. 2B

FIG. 2A

From FIG. 2A 215 The enrgy port is manipulated so as to cause a release of energy from electrodes 119. This is similar to step 211 and 213. The lesions effected in all three of these steps have the effect of shrinking the trigone area so as to relieve pressure on the bladderneck. The three dimensional geometry is altered and the scar tissue created by the application of energy is stronger and better able to resist abdominal pressure. -216 The irrigation and control port 135 is manipulated so as to stop the flow of cooling liquid from the aperture 118. Suction may be applied to remove excess cooling liquid. -217 Pharmaceutical agents may be locally administered by manipulating the irrigation and aspiration control ports. -218 The catheter 110 is withdrawn from the urethra.

FIG. 2B



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The electrical energy port 333 is coupled to a source of electrical energy. Patient has voided and is positioned on a treatment table.

The patient's external genitalia and surrounding anatomy are cleansed with an appropriate agent such as Betadine or benzalkonium chloride.

The visualization port 331is coupled to the appropriate visualization apparatus such as fluoroscope, an endoscope, a display screen or other device.

The apparatus port 332 is coupled to an external medical device such as a pH meter, a pressure gauge or other medical monitor.

The energy port 336 is coupled to a source of any of the aforementioned types of therapeutic energy.

Suction, inflation or fluid infusion apparatus is coupled to the irrigation and aspiration control ports 335.

The most distal end of the balloon 320 is lubricated and introduced into the urethral meatus in an upward and backward direction in much the same way a Foley catheter is introduced. In a preferred embodiment, the balloon 320 is completely deflated during insertion.

The catheter 310 is threaded through the urethra until the microporous balloon 320 is entirely in the bladder. An introducer sheath or guidetube 314 may be used to facilitate insertion.

The position of the catheter 310 is checked using visualization apparatus coupled to the visualization port 331. This apparatus can be continually monitored by medical professionals throughout the procedure.

The irrigation and aspiration control port 335 is manipulated so as to inflate the microporous treatment balloon 320 with a cooling liquid such as sterile water, saline or glycerine.

The electrodes 322 are selected using the electrode selection and control switch 334.

The translation member 312 is manipulated to alter the shape of the most distal end of the balloon 320 so as to bring the distal end in optimal physical contact with the top of the bladder.

The individual nerves within the bladder are identified using sensors 323. This step is optional.

The energy port 336 is manipulated so as to cause a release of energy from the electrodes 322. This release of energy creates a pattern of lesions in the mucosal and/or submucosal tissues of the bladder or portions thereof. The affected area shrinks and is relatively strengthened, so as to better retain urine.

To FIG. 4B

FIG. 4A

From FIG. 4A

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The energy port 336 is manipulated so as to cause a release of energy from the electrodes 322 that were identified in step 412. Partial or complete ablation of these nerves may affect incontinence caused by an uncontrollable urge to urinate. This step is optional.

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Bulking agents or microspheres are exuded from selected electrodes 322 positioned near the base of the bladder. These bulking agents can be used to strengthen the structure to prevent stress incontinence.

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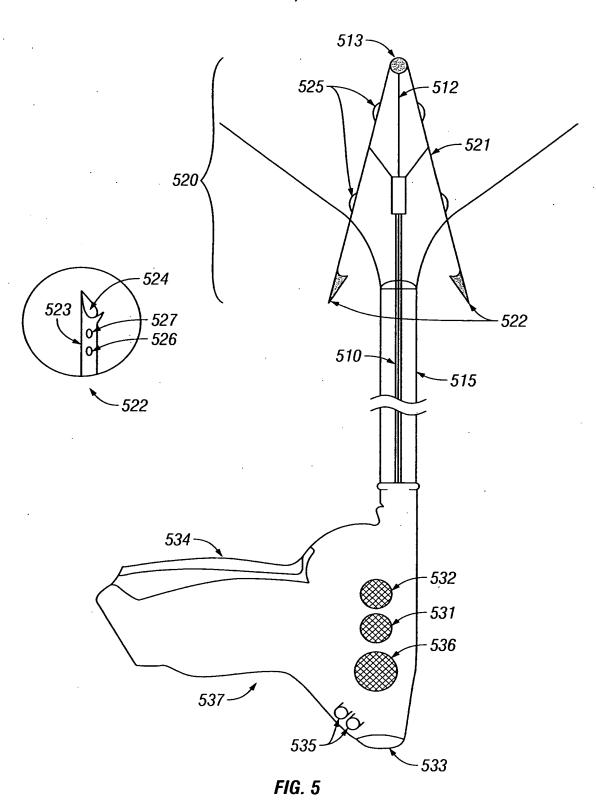
Pharmacological agents may be locally administered by manipulating the irrigation and aspiration control ports 335. This step may occur any time prior to withdrawal of catheter 310, thereby causing the balloon to deflate.

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The irrigation and aspiration control port 335 is manipulated so as to reverse the flow of cooling liquid from the microporous treatment balloon 320, thereby causing the balloon to deflate.

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The catheter 310 is withdrawn from the urethra.



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The electrical energy port 522 is coupled to a source of electrical energy. Patient has voided and is positioned on a treatment table. -601 The patient's external genitalia and surrounding anatomy are cleansed with an appropriate agent such as Betadine or benzalkonium chloride. -602 The visualization port 534 is coupled to the appropriate visualization apparatus such as fluoroscope, an endoscope, a display screen or other visualization device. -603 The apparatus port 532 is coupled to an external medical device such as a pH meter, a pressure gauge or other medical equipment. -604 The energy port 536 is coupled to any of the aforementioned types of therapeutic energy. -605 Suction, inflation or fluid infusion apparatus is coupled to the irrigation and aspiration control ports 535 so that cooling fluids and pharmacological agents may be infused. -606 The tapered tip 513 is lubricated and introduced into the urethral meatus in an upward and backward direction, in much the same way a Foley catheter is introduced. -607 The catheter 510 is threaded through the urethra

until the treatment element 520 has completely passed the bladderneck and is entirely in the bladder. An introducer sheath or quid tube may

be used to facilitate insertion.

608 The position of the catheter 510 is checked using visualization apparatus coupled to the visualization port 531. -609 The irrigation and aspiration control port 535 is manipulated so as to exude a cooling fluid. 610 Tension is applied to the translation member 512 to cause the extension of the struts 521. Extension of the struts 521 brings the electrodes 522 into close physical proximity with the walls of the bladder. -611 Suction may be applied through the aspiration ports 532 so as to bring the walls of the bladder in even closer proximity of the treatment element 520. 612 Electrodes 522 are selected using the electrode selection and control switch 534.

The individual nerves within the bladder are identified using the sensors 526. This step is optional.

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The energy port 536 is manipulated so as to cause a release of energy from the electrodes 522. This release of energy creates a pattern of lesions in the mucosal and/or submucosal tissues to the bladder or portions thereof. The affected area shrinks and is relatively strengthened, so as to better retain urine.

To FIG. 6B

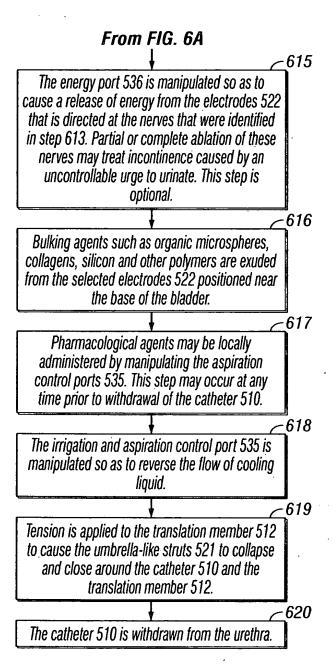


FIG. 6B